

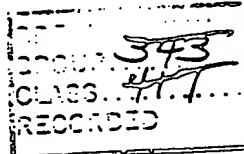
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JEFFREY WILLIAM SPENCER



(54) "PUMPS"

(71) We, LIMITED, a Road, Leicester the invention may be granted which it is to described statement:—

This invention dispensing as a glass or

According dispensing includes a connector

material adapted of a range of and shapes to said neck the pump on

ENGG

Pump for dispensing from container - has resilient material connector able to be pushed onto bottles of varying sizes

ENGLISH GLASS CO 20.12.73-GB-059166

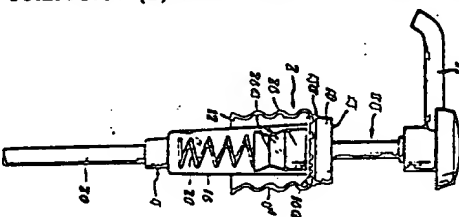
Q56 (12.05.76) F04b-09/14 F04b-19/04 F04b-21

The pump for dispensing liquids from a container has a connector (2) of resilient material able to be pushed onto the

neck of a range of sizes of bottles. The connector has ribs (8) extending inwards to contact the bottle.

The connector can be corrugated for this purpose, with constant thickness walls, or with thicker wall areas at the

base of the ribs closest to the bottle neck. The connector has a flared mouth (12) to guide it onto the bottle neck, and is retained by its elastic deformation on the bottle. Operation of the sprung pump plunger (24) tends to keep the assembly in place. 17.9.74 (6pp)



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enoted 2 in of resilient hey can be s of varying size of hand- ng pump 4

is moulded d has three projecting l extending . The outer has shallow iding to the ing smooth at the wall es along its

Preferably the connector has at least one rib extending internally around the connector to contact the container neck and may have a flared mouth adapted to guide the connector onto the neck.

Embodiments of the invention will now be described in detail with reference to the accompanying drawings, in which:—

Figure 1 is a sectional elevation of a connector of a pump according to a first embodiment of the invention;

Figure 2 is an elevation of a second embodiment of the invention with a modified connector shown in section;

Figures 3a and 3b are respective elevations of the pump showing the outside of the connectors of Figures 1 and 2, and of the pump fitted to a bottle;

Figures 4a to 4c are respectively an under-neath plan view of a connector for a third embodiment, a sectional elevation of this connector, and an elevation of this pump fitted to a bottle;

Figures 5a to 5c are similar views to Figures 4a to 4c, corresponding to a fourth embodiment of the invention; and

length.

One end of the connector 2 shown in Figure 1 has an inwardly-projecting annular flange 10 by which it is fixed to the pump 4, Figure 3a, and the opposite end has a flared mouth 12 to facilitate stretching the connector over the neck 13a of a bottle 13, Figure 3b.

In Figure 2, parts of the connector 2 corresponding to the parts in Figure 1 already described have like reference numerals. The wall thickness of the connector 2 in this case is constant, however, such that deeper grooves 8' are formed in the outer circumference. The connectors 2 in these two figures are made of the same elastomeric material, that shown in Figure 2 thus being more easily stretched radially outwardly.

The flange 10 of either connector 2 is clamped between annular flanges 14a, 16a of upper and lower rigid plastics body members 14, 16 of the pump 4 which are glued together in assembly. For use of the pump, it is applied to the bottle 13, Figure 3b, by insertion of a plastics suction pipe 20 of the pump, and then the member 16 to which the pipe 20 is connected, into the bottle neck 13a. The



flared mouth 12 of the connector 2 comes to bear on the bottle, and the connector or the member 14 of the pump is then pressed to push the connector 2 over the neck 13a, the material of the connector stretching to accommodate the bottle neck and the internal ribs 6 jumping one by one over a screw-thread or lugs (not shown) formed on the neck. The connector then remains elastically deformed to grip the neck 13a; it can be designed so that the weight of the bottle 13 when full can be carried by lifting it by holding a plastics spout member 22 of the pump.

The pump is used to dispense a substance from the bottle 13 by hand pressure applied to the spout member 22. To the latter is fixed a rigid plastics discharge pipe 24 which acts as a push-rod, passing through the member 14 of the pump and connected to a hollow piston 26 arranged for reciprocating with a seal 26a in the member 16, which is cylindrical. The piston 26 is urged upwardly by a conical coil spring 28 in the member 16; a non-return valve (not shown) is also arranged in the member 16, at the bottom of the member.

The pumps shown in Figures 4c and 5c are the same as the one just described, except that two alternative forms of the connector 2 are used, both having annular flanges 10 for fixing the connector to the pump 4 as described above and external longitudinal ribs 29 by which they may be gripped. Referring to Figures 4a and 4b, the first alternative connector has six straight longitudinal internal moulded ribs 30 of triangular cross-section, these being spaced equally around and projecting radially inwardly of the connector circumference. When the connector is pushed over the bottle neck 13a the ribs 30 are compressed and pushed radially outwardly to deform the periphery of the connector elastically and thus grip the neck. The lower ends of the ribs have chamfers 30a to aid the entry of the bottle neck into the connector. The ribs may be designed to bend under the compression, so as to be non-radial, and/or the bending can be brought about by turning the pumps as it is applied to the bottle about the direction in which it is being so applied.

The second alternative form of connector has, with reference to Figures 5a and 5b, an integrally moulded cylindrical wall 32 suspended from the annular flange 10 concentrically with an outer wall 31 of the connector. The lower end of this wall has an inwardly-projecting annular lip 32a divided equally into six segments. The wall 32 stretches over the bottle neck 13a as the pump is applied to the bottle and the lip 32a, or the wall 32 and the lip 32a, grips the neck 13a. The outer wall 31, bearing the ribs 29, may be made thicker and more rigid in this

embodiment compared with the last embodiment of the invention and can be designed to prevent the wall 32 distorting in such a way it rolls up and does not stretch over the bottle neck, by limiting the outward movement of the wall.

As shown in Figure 6 of the accompanying drawings, a modified form of the connector 2 of Figure 1 has an turned-back flange 10' with a strengthening bead or thickening 33 at its innermost edge. Flange 34 of the pump body member 16' has a slightly upstanding wall or ring 35. The backturning of the flange 10' and the provision of the wall 35 assist the ready assembly of the pump with the connector, and a positive retention of the connector on the pump.

All the resilient connectors described above can accommodate bottle necks of different diameters by stretching to a greater or lesser extent within design limits. This is assisted by the flared mouth 12 and chamfers 30a. The bottle neck need not be threaded because the ribs 6 and 30 and the lip 32a are capable of gripping on plain necks. To remove the pump from any of these necks it is pulled, preferably by gripping the connector, away from the bottle. It is possible for the connectors to accommodate bottle necks having cross-sections other than circular. But the invention is particularly applicable to screw-top bottles of sauces and dressings in domestic use, to allow a pump to be transferred from an empty bottle to a new one or between one sauce or dressing bottle and another as required, even if these are of different sizes. The elastomeric material of the connector in this application of the invention is a non-toxic one.

#### WHAT WE CLAIM IS:—

1. A pump for dispensing a substance from a container including a connector of resilient elastomeric material adapted to be pushed onto any one of a range of container necks of varying sizes and shapes by deforming elastically and to fit to said neck by said deforming, so as to retain the pump on the container.

2. A pump according to claim 1 wherein the connector has at least one rib extending internally around the connector to contact the container neck.

3. A pump according to claim 2 wherein the connector is an annular sleeve of an elastomeric material with a corrugated inner and outer periphery, the corrugations lying in planes normal to the central axis of the sleeve.

4. A pump according to claim 3 wherein the corrugations are of the same depth in the inner and outer peripheries so that the wall of the sleeve is of constant radial thickness.

5. A pump according to claim 3 wherein the corrugations in the outer periphery are less deep than those in the inner, whereby inwardly projecting ribs in the inner

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periphery are provided by portions of the wall of greater radial thickness.

5 6. A pump according to claim 1 wherein the connector and extending parallel to the direction in which it is pushed onto the container.

7. A pump according to any one of the preceding claims which has a flared mouth adapted to guide the connector onto the neck.

10 8. A pump according to any one of the preceding claims wherein the connector has at one axial end an annular flange, the flange being entrapped between flanges on respective body parts of the pump.

9. A pump according to claim 8 wherein 15 the annular flange of the connector has a bead at its innermost edge and a flange of a body part has a projecting rim lying outside and entrapping the said bead.

10. Pumps substantially as herein 20 described with reference to the accompanying drawings.

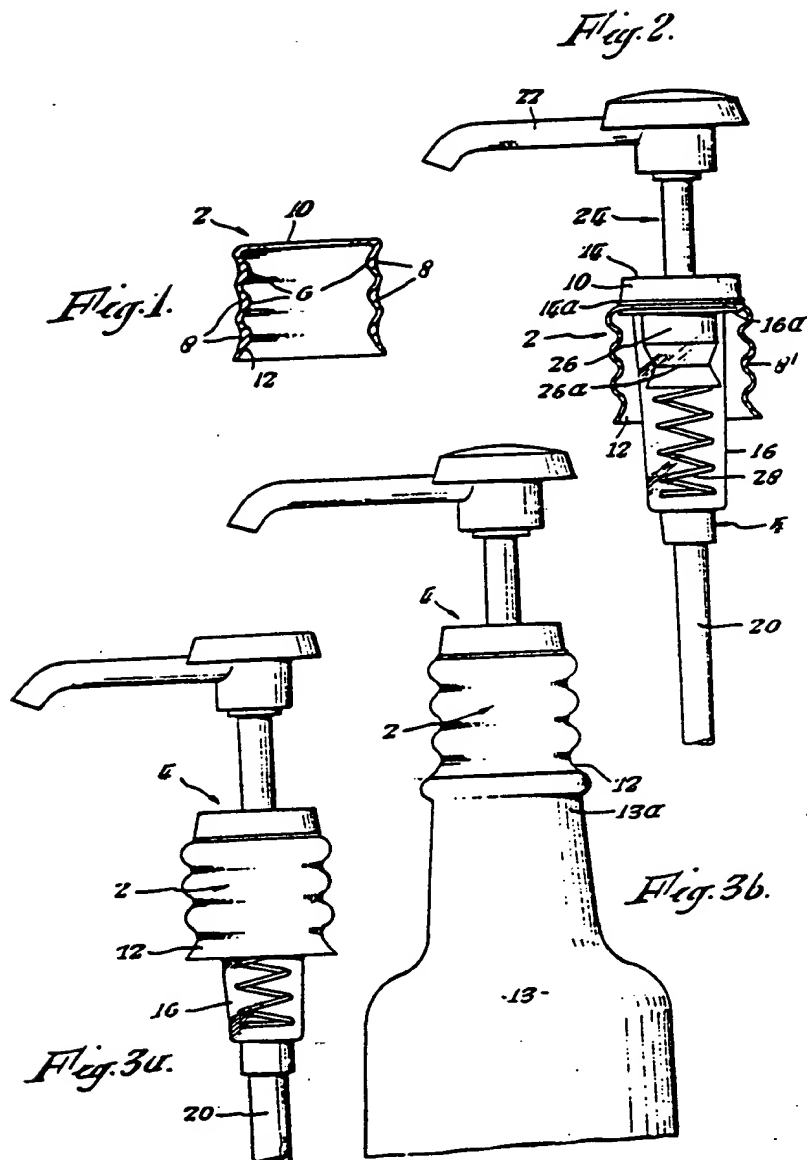
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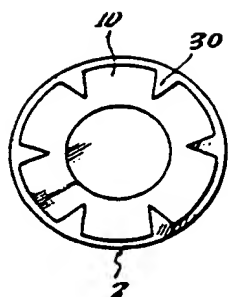
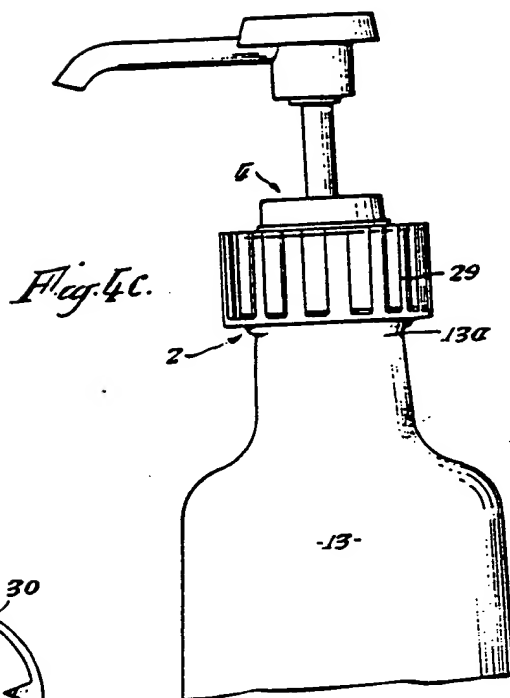


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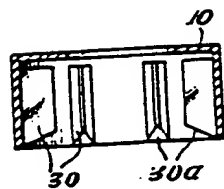
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*Fig. 4a.*



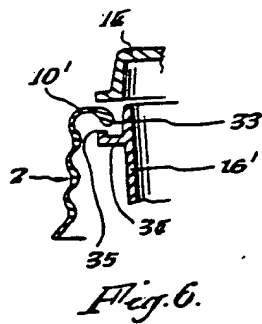
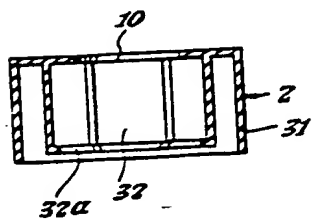
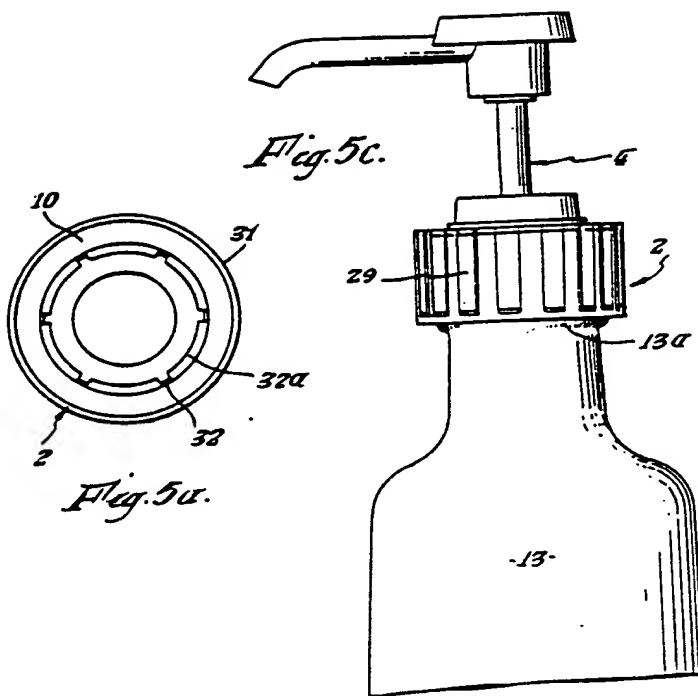
*Fig. 4b.*

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